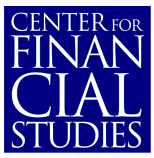

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Revised version

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Why Borrowers Pay Premiums to Larger Lenders: Empirical Evidence from Sovereign Syndicated Loans

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Revised version

Abstract:
All other terms being equal (e.g. seniority), syndicated loan contracts provide larger lending compensations (in percentage points) to institutions funding larger amounts. This paper explores empirically the motivation for such a price design on a sample of sovereign syndicated loans in the period 1990-1997. I find strong evidence that a larger premium is associated with higher renegotiation probability and information asymmetries. It hardly has any impact on the number of lenders though. This is consistent with the hypothesis that larger lenders act as main lenders, namely help reduce information asymmetries and provide services in situations of liquidity shortage. This constitutes new evidence of the existence of compensations for such unique services. Moreover, larger payment discrepancies are also associated with larger syndicated loan amounts. This provides further new evidence that larger borrowers bear additional borrowing costs.

JEL Classification: F34, G21, G33

Keywords: Relationship Lending; Number of Lenders; Syndicated Loans; Sovereign Debt

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All errors are my own responsibility.

1 Introduction

Loan syndication and the structure of debts have raised growing attention in the recent literature. This study is intended to analyze the economic motivations for borrowers to favor *larger* lending by offering larger premiums to larger providers within a single syndicated facility, all participants being subject to same rights and duties on paper. Previous authors have predicted three main likely services provided in return by the larger lenders. First, the debtor is likely to benefit from a reduced number of lending relationships. Second, *large* or main creditors may play an important function in distress circumstances, especially by providing refinancing insurance. Last, provided the limited financing ability of existing banks, successful large loan syndication may depend on the individual contributions. Thus, larger borrowers bear bigger borrowing costs by giving incentives to creditors to provide extra lending. The results are consistent with the main bank and borrowing costs hypotheses. The fee discrepancy has little effect on the number of lenders.

The syndicated loan is a single facility financed by a group of banks under the same conditions. In this type of contract, lenders' returns increase in *basis points* as a function of the committed amount, all other terms being equal (e.g. seniority). The premium is reflected in the front-end fee (the so-called *up-front fee* is charged at the signature date of the contract, before any amount is yet paid out). I suggest the empirical study of such a price differential that explores the motivation, from the borrower's perspective, to favor larger lenders to emerge. Indeed, the borrower, strongly advised by his arrangers, predefines the function that relates the individual funded amount and the premium before the syndication is launched. The study is based on a sample of 100 loans issued or guaranteed by sovereign agents in the period, January 1990 to December 1997. I conduct the analysis on sovereign capital markets because the latter suffer from particularly poor legal frameworks, allowing for a better disentanglement between the respective risks of renegotiation and of repudiation (pure default).

The first hypothesis is therefore that the borrower compensates larger lenders to reduce the number of lenders and associated costs. Apparently, the device is useful to the sovereign state that is short in liquidity, but still, is unwilling to default strategically and would like to maintain future access to capital markets. This is consistent with the hypothesis that renegotiation costs are increase in function of the lack of coordination among lenders (Bolton and Sharfstein (1996), Preece and Mullineaux (1996), Brunner and Krahnen (2001)). Besides, borrowers who present substantial information asymmetries and numerous lending relationships face higher probabilities of coordination failure among lenders (Morris and Shin (2002)). Hence, favoring the concentration of liabilities would reduce the number of participants, at some minimal cost, and constitute a sound approach to avoid inefficient pre-emptive actions. I find little evidence of price differential having a significant and negative impact on the number of financial institutions joining the syndicate.

Independently of the number of lenders, the borrower is likely to compensate his main banks for services related to periods of liquidity shortage. In contrast to previous studies that proxied relationship lending with the duration of lending, Elsas (2002) finds that the key element that makes a bank view itself as a relationship lender is the size of its share in the borrower's external financing. Moreover, it has been highlighted that one of the main functions of the *main bank* is to act as a liquidity insurer in situations of unexpected deterioration (Elsas and Krahnen (1998)). Although previous authors find evidence that the main banks fulfill this role, they hardly find compensations reflected in credits costs. I do find that expected renegotiation and information asymmetries have a significant impact on the lending premium.

Last, the number of lending relationships is determined by the size of the borrower (Petersen and Rajan (1994), Ongena and Smith (2000), and Machauer and Weber (2000)). Authors did not find any impact of the borrower size on the price of debts though. I find that discrepancies among fees income are substantially affected by the *absolute* size of the loan. This constitutes new evidence that a larger loan size (hence larger borrower) yields larger costs.

The analysis of the distribution of lending compensations in function of individual commitments within the same credit facility permits to draw answers to questions concerning the number of lending relationships and the structure of lenders. The findings are also related to the literature that addresses the services provided by main banks. The study also relates to the literature aimed at understanding how syndicated loans operate. To a lesser extent though, the study contributes to the literature on sovereign debts.

The paper is organized as follows. In the next section I describe in further detail the theory behind the empirical investigation. Section 3 contains the description of the empirical models. In section 4 the sampling procedure, the actuarial calculations, and the data set are described. The results and their interpretation are reported in section 5. Section 6 presents the sensitivity analysis. The last section provides concluding remarks.

2 Theoretical background

2.1 The optimal number of lenders and relationship lending

The impact of the number of lenders on borrowing costs has been well investigated. It is mainly proportional to information collection and renegotiation costs. Under the asymmetric information approach, Sharpe (1990), Diamond (1991) and Rajan (1992) show that a close and repeated lending relationship, reflected by the reduced number of lenders, decreases amounts of information asymmetries and associated costs. This affects the smaller and less public borrower. On the other hand, the smaller number of lenders also increases every lender's own voting rights in the event of a financial distress. The "information monopoly" also may result in a "lending hold-up" from inside lenders being in monopolistic position. Bolton and Scharfstein (1996) demonstrate that there is an optimal debt structure that balances these effects. The higher number of lenders will deter the manager to default strategically that is to divert cash. However, facing a liquidity shortage beyond the manager's control, the inevitable distress will incur higher renegotiation cost due to the lack of

coordination among lenders. A recent line of research (Brunner and Krahnen (2001), Morris and Shin (2002)) highlighted the costs related to the coordination failure among lenders, also known as the "common pool" problem. The common pool problem is created as at least one creditor withdraws from the pool of lenders and request early repayment even if the project is feasible. This unnecessary financial distress is caused by high information asymmetries. Therefore, in this case, cutting the number of banks reduces the probability that such an event occurs.

Empirical studies document evidence suggesting that the issue of bank private loans had a positive impact on the value of the firm in contrast with publicly tradable debts (James (1987)), more specifically the private loan renewal (Lummer and McConnel (1989)). Further analyses validated that the borrower has a larger set of lenders as the amount of asymmetric information declines (Petersen and Rajan (1994) and Dennis and Mullineaux (2000)) while coordination has a positive impact on the value of the lending institution's stocks (Brunner and Krahnen (2001)). The value of the syndicated loan is also found to be a negative function of the number of syndicated lenders that are believed to increase the renegotiation costs (Preece and Mullineaux (1996)) and of the credit rating of the lending institutions (Billett *et al.* (1995)). This provides evidence of the renegotiation costs affecting the value of the asset. Main banks also fulfill the role of liquidity insurer and renegotiation coordinator (Elsas and Krahnen (1998)). Note that it is not by chance that renegotiation costs are compensated up-front. Interestingly, the bank loan non-linear structure of pricing is set up specifically in order to balance bargaining power in future renegotiation (Gorton an Khan (2000), Hallak (2001)).

Last, the weak creditor rights and poor legal enforcement are associated with more lending relationships (Ongena and Smith (2000)) and more scattered ownership structure on project finance (Esty and Megginson (2003)). Hence, international syndication in a limited legal structure is aimed at deterring strategic default rather than to enhance the monitoring or facilitate the renegotiation.

2.2. Lending amounts

An alternative explanation for the price discrimination on syndicated loans follows the line of research on the borrower's size and its impact on borrowing costs. Presumably, the larger borrower would increase the price differential and add several ranks to reach several lending markets, thus attempting to expand the number of lending relationships. The motivation is the size of the loan which in turn is likely to be related to the size of the firm (Petersen and Rajan (1994), Ongena and Smith (2000), Machauer and Weber (2000)). The larger country that issues larger debt amounts may request funds beyond financing capacities of existing banks. Although previous research found little evidence of the number of banking relationship affecting the interest margin, additional cost might be reflected in the front-end payments. The interest premium will however follow the creditworthiness compensation accordingly to the borrowed volumes. The positive impact of the loan amount and the number of ranks on the price discrepancy would be consistent with the hypothesis.

Note however that by compensating lenders according to their individual commitments, the borrower may be attempting to quantity-based price discriminate in order to reduce borrowing costs. The borrower therefore taps various lending market segments, thus attempting to minimize borrowing costs and/or increase borrowing capacities. Although the literature provides a wide range of illustrations, quantity based price discrimination is hardly documented on financial products. However, the non-linear pattern of syndication pricing will let the borrower decrease his borrowing costs the same way the monopolist increases his profits. The intuition is as follows. The monopolist borrower offers a relatively low lending amount to the low-demand lender. The borrower thus captures the low-supply lender surplus and reduces the high-demand costs. The borrower hence enlarges the spectrum of lending patterns and by doing so the number of lenders. The reasoning follows Mirrlees (1971).

2.3. What is different about sovereigns?

The sovereign agent is the state or any national entity which acts on behalf of the state (usually government entities and the central bank). There are two essential differences between corporate and sovereign debt markets. These are the two reasons why I conduct the investigation in these markets.

First, state representative individuals and property goods usually are immune in their own jurisdiction and hardly subject to foreign legislations. The sovereign defaulter is however subject to sanctions from the business community. In fact, international financial institutions usually deny future access to foreign-currency debts to the defaulter, thus preventing the latter from consumption smoothing (Eaton and Gersovitz (1981), Cole *et. al* (1995), Grossman and Han (1999)). Moreover, Rose (2002) shows empirically that the default on foreign debts is likely to result in a reduction of foreign trade, e.g. because of the rejection of letters of credit from financial institutions. Creditors may also have the right to seize debtor's cash and assets available abroad (Bulow and Rogoff (1989), Hallak (2003)). The amount of collateral is however rather small and uneasy to seize in a swift manner. Although this may have an impact on bond debt markets (Hallak (2003)), it is unlikely to be the case in bank credit markets where coordination among lenders is binding.[1] In fact, the repayment of foreign bank debts is chiefly reputation motivated to allow further credits.[2]

This first remark implies an important economic consequence. Namely, according to his expected cash-flow, the distressed debtor can freely assess whether to repay or renegotiate the terms of debts. The respective probabilities that the sovereign may either default or renegotiate debts are more easily proxied and disentangled.

The second interesting difference between the sovereign and the corporate debt markets concerns the absence of bankruptcy code and the more acute costs associated with the lack of coordination among lenders (Eichengreen and Portes (1995), White (2002)). Hence, the fewer the

[1] The coercive *cross-default* clause is a usual clause in international syndicated loans. It states that the default on any one loan implies the default on all other indebtedness of the same borrower or of related entities.
[2] See Eaton and Fernandez (1995) for a review of the sovereign debt literature.

participants in the renegotiation are, the better is the distressed sovereign. Secondly, limiting the number of creditors will also reduce costs due to information asymmetries. In short, the sovereign debtors will pay further attention at the number of lenders and relationship lending.

There are however similarities between a corporate and a sovereign debtor. Like firms, the sovereign seeks to prevent any information hold-up, possibly extracted by an oligopoly of lenders. A larger set of lenders also gives access to larger amounts. Moreover, in the absence of a bankruptcy code, more than a firm, the sovereign will pay attention to the "common pool problem" (Morris and Shin (2002)).

Assuming the credit interest margin reflects the creditworthiness, the larger premium reflected in front-end payments implies larger borrowing costs. The fees discrepancy yields higher committing amounts, thus reducing the number of financial institutions participating to the syndicate. Therefore, a suitable motivation for the pricing design is that the payment is aimed to cover other costs associated with the number of creditors. In particular, the larger are the foreign currency liquidities that are available to the state, the more likely the latter will attempt to widen the set of lenders to reduce the hold-up problem and also to have access to larger amounts in the future. Instead, limited cash availability makes the borrower willing to reduce the number of banks to prepare likely renegotiation. In this purpose, the premium is larger to obtain funds with fewer participants. Doing so, the borrower implicitly creates a set of large lenders who presumably help refinance while in distress.

In short, the sovereign and the corporate debtors suffer and benefit from the same advantages and disadvantages from a reduced or a large set of lenders, maintaining a main bank or encouraging one to emerge, and borrowing costs associated with large amounts. The sovereign debts is interesting first because it allows a better disentangling of renegotiation and default expected costs, second because lenders coordination issues are more acute. These features bear substantial consequences for the conduct of the study.

3 Model specifications

3.1. The economic motivation for compensating larger lenders

The first model is intended to measure the impact of the determinants of financial distress and volatility on the lending premium. The model specification for the price differential calculated as the difference between top and bottom end fees is of the form:

$$\begin{aligned} \textit{Up-front fees differential}_{i,j,k} = \; & \textit{Constant} + \Psi_0 \, \textit{Dummies}_{i.k} \\ & + y_1 \, \textit{Loan amount}_i \\ & + y_2 \, \textit{Liquidity}_{j,k} \\ & + y_3 \, \textit{Solvency}_{j,k} \\ & + y_4 \, \textit{Public information}_{j,k} \\ & + y_5 \, \textit{Variability of income}_{j,k} \\ & + y_6 \, \textit{Country Dummy}_{j,k} \\ & + \textit{Error}_{i,j,k} \end{aligned} \qquad (1)$$

where a subscript *i* indicates that the variable refers to the *i*th loan observation. Coefficients are real terms. Similarly subscripts *j* and *k* respectively indicate a variable regarding the *j*th country and *k*th year. Upper-case coefficients indicate vectors.

The country dummies correct for specific effects of highly represented countries in the data set, namely Turkey and India. The loan amount is reported in constant billions of 1995 US dollars. The up-front fees differential is calculated as the difference between the highest and the lowest front-end payments in percentage points. This provides with the larger lender premium. I remind that the borrower and the arrangers design the various bids constituted of fee-volume contracts before the syndication is launched.

The first variable is the *amount of the loan*. I expect the borrower to offer incentives to creditors to provide larger amounts in order to raise the requested funds. As the targeted amount increases, the price discrepancy is likely to widen. If the larger borrower bears larger borrowing costs, I expect y_1 to be significantly positive.

The proxy for liquidity equals the ratio of the amount of foreign currency reserves available to the sovereign by the public and publicly guaranteed (PPG) short-term debt. This liquidity indicator is now frequently used (e.g. Eichengreen and Mody (2000)). The ratios of reserves to imports and short-term debt to exports are two alternative proxies. However, results showed they added no information in the model estimates. The liquidity variable indicates the probability of a temporary foreign-currency shortage. In the sovereign debt perspective, this is assumed to indicate that default and the subsequent credit disruption is not necessarily maximizing the country's aggregated utility. Instead, the sovereign will seek to renegotiate the loan arrangements. The liquidity variable, hence, indicates the perspective of renegotiation rather than debt repudiation. When the borrower faces high probability of liquidity shortage, she will seek to reduce the number of lending relationships so that renegotiation becomes less costly. Alternatively, she will compensate the large lender for a possible future role during renegotiation. This is consistent with the literature on relationship lending and the design of bank loans (e.g. Elsas and Krahnen (1998), Gorton and Khan (2000), Hallak (2001)). Thus, should the differential be related to expected renegotiation, the sign of y_2 is expected to be positive, thus increasing the payment discrepancy between the lowest and the highest committing bank. Should be the borrower be attempting to reduce the number of lenders, the impact on the number of lenders should be negative too. This is described in Model (2).

The proxy for solvency is the ratio of the total amount of PPG long-term debt (lifetime more than a year) relative to GNP. Solvency in the sovereign debt literature indicates that the liabilities are of a larger amount than the expected cash flows. In this case, credit disruption is unlikely to be a credible threat to the sovereign debtor. Unlike the liquidity constraint, solvency is expected to hardly affect the fees differential since the default risk is already reflected by the interest rate premium itself. Should it be reflected in the front-end fee differential, the interpretation of the se fees should be completely different. It would reflect instead the risk aversion of lenders asking for larger compensations as their commitments augment. However, there is no reason then why the

price differential should not be reflected in the interest mark-up instead. Overall, y_3 is expected to be insignificant.

Measuring the amount and quality of the public information on less-developed countries is a sensitive issue, mainly among less-developed countries. Transparency indices usually reflect the state of corruption in the country. Moreover, the judging of the quality of the nation's accounts is very subjective. Therefore, I measure the *Public information* available to capital markets by the ratio of the PPG debts contracted from all private creditors (i.e. bonds plus bank debts) by the issuing country relative to the total amount of PPG LDC debts contracted from private creditors. The rationale is that the more debts financial institutions hold (relative to all developing debt countries debts), the larger is likely to be the amount of information regarding the particular borrower. An alternative solution is the use of a dummy variable indicating the presence of a bond market. In fact, the presence of tradable debts usually provides an easily accessible price and rating of credit. Should the borrower benefit from substantial investors' knowledge regarding her creditworthiness, the lesser would she need to reduce the number of lenders, or compensate the main lender for reducing information asymmetries costs. Therefore, y_4 is expected to be negative.

The *Variability of income* variable is a proxy for the potential asymmetries of information. The variable indicates the extent to which private information can be hidden. The higher the variability of income the more a borrower is able to hide information on future incomes. The lenders will therefore request larger payments for larger funding amounts. The variability of income is therefore expected to affect positively the price differential and y_5 to be positive.

3.2. The number of participants in sovereign syndicated loans

The second model explores the impact of the fees differential on the number of banks joining the syndicate. The model of syndicated lenders to be estimated is of the form:

$$\begin{aligned} \textit{Number of joining lenders}_{i,.j,k} \quad = \quad & \textit{Constant} + \Phi_0\, \textit{Dummies}_{j,k} \\ & + f_1\, \textit{Up-front fees differential}_i \\ & + f_2\, \textit{Loan amount}_i \\ & + f_3\, \textit{Number of arrangers}_i \\ & + f_4\, \textit{Lifetime}_i \\ & + \textit{Error}_{i,j} \end{aligned} \qquad (2)$$

where a subscript *i* indicates that the variable refers to the *i*th loan observation. Similarly subscript *j* and *k* respectively indicate a variable regarding the *j*th country and year *k*. Upper-case coefficients indicate vectors.

The up-front fees differential, the loan amount and the dummies are the same as described previously. Model (2) is consistent with the hypothesis that the compensation discrepancy indeed has an impact on the number of lenders joining the syndicate. Based on the discussion in Section 2, I expect f_1 is negative if the premium is intended to reduce renegotiation costs, positive if instead it is aimed at reducing borrowing costs. On the contrary, I expect f_2 is positive.

3.3. Endogeneity of the number of lenders to the price differential

Although the pricing is determined beforehand, the price differential is likely to be determined endogenously by the targeted number of lenders. In the third model, the number of joining lenders is added in Model (1) as a determinant of the fees differential to form the following model:

$$\begin{aligned} \textit{Up-front fees differential}_{i,j,k} = \quad & \textit{Constant} + \Psi_0^{'}.\textit{Dummies}_{i.k} \\ & + y_1^{'}\, \textit{Number of joining lenders}_i \\ & + y_2^{'}\, \textit{Liquidity}_{j,k} \\ & + y_3^{'}\, \textit{Solvency}_{j,k} \\ & + y_4^{'}\, \textit{Public information}_{j,k} \\ & + y_5^{'}\, \textit{Variability of per capita income}_{j,k} \\ & + \textit{Error}_{i,j,k} \end{aligned} \qquad (1')$$

Simultaneous equation Model (1)-(2') also helps disentangle the number of lenders from the large lender hypotheses. In fact, if the expected renegotiation costs affect the price discrepancy, and

the price discrepancy has a negative impact on the number of lenders, then indeed the premium is aimed at reducing the number of lenders. If the second condition is not fulfilled, namely there is no impact on the number of lenders, then one should conclude that the premium is distributed for the services provided during renegotiation. It also predicts that large lender does behave like a relationship lender. This is consistent with e.g. Elsas (2002).

The model defined by equations (1')-(2) cannot however be estimated using ordinary least squares, for each model includes amongst its explanatory variables the dependent variable of the other model. Consequently, the endogenous variables will be correlated with the error terms. As a result estimating these models by using the ordinary least squares is inconsistent. Instead, two-stage least squares provide consistent estimates of the coefficients and disturbances. For this the model needs to be identified, a necessary condition of identification of the equation is that the number of exogenous variables excluded from the equation must not be less than the number of endogenous variables included in that equation. The identification condition is satisfied in each equation of model (1')-(2).

3.4. The number of arranging banks

The study extends to the number of arranging (also "mandated") banks. Because the arrangers generally are large banks, I suspect they may fulfill the alternative roles of large lenders that I am investigating. Although mandated banks usually are part of the pool of lenders, they receive a separate and always undisclosed payment on top of lending compensations. As a result, the pricing analysis would be misleading. Instead, I believe that the number of arranging banks is an appropriate proxy and I can yield interesting implications regarding the role they fulfill.

Indeed, since they are selected by the borrower *ex-ante*, their large number would translate either the attempt to reduce the number of lenders joining the syndicate and/or to obtain pre-commitments by more banks when loan amounts are large. Also, their relatively larger number may

be helpful when liquidities are scarce.[3] Independently of the roles for large banks that I am investigating, arrangers may play a role in reducing asymmetries information and establish confidence to other lenders. In fact, their credibility along with their business partnerships presumably constitutes an asset for the debtor.

I therefore look at the impact of information asymmetries, liquidity and solvency risks, as well as the size of the loan on the number of arrangers. The model captures all roles possibly assigned *ex-ante* to the arranging banks, i.e. reducing the number of lenders, being/becoming main banks, and obtain pre-commitments to increase the probability of fund raising success. Thus, the model of the number of arranging banks is:

$$\begin{aligned} \textit{Number of arrangers}_{i,j,k} \quad = \quad & \textit{Constant} + \Gamma_0 \, \textit{Dummies}_{i.k} \\ & + g_1 \, \textit{Loan amount}_i \\ & + g_2 \, \textit{Liquidity}_{j,k} \\ & + g_3 \, \textit{Solvency}_{j,k} \\ & + g_4 \, \textit{Public information}_{j,k} \\ & + g_5 \, \textit{Variability of income}_{j,k} \\ & + \textit{Error}_{i,j,k} \end{aligned} \tag{3}$$

where a subscript *i* indicates that the variable refers to the *i*th loan observation. Similarly subscript *j* and *k* respectively indicate a variable regarding the *j*th country and *k*th year. Upper-case coefficients indicate vectors.

In line with previous hypotheses, I expect that the proxies for public information and information asymmetries would have positive and negative impacts on the number of arrangers respectively. The sign of g_4 is hence expected positive, and g_5 negative. If the arrangers provide liquidity insurance, the sign of g_2 is expected positive. If the arrangers provide pre-commitments in the facility and foster the success of the fund raising, the loan amount should have a positive impact on the number of arrangers. The sign of g_1 is expected positive.

[3] As we will see, the mean number of arrangers is of three. In the sample, ninety percent of loans have six arrangers or less. The risk of coordination failure is therefore limited.

4 Sampling and data description

The sample of contracts is assembled from various issues of the International Financing Review (IFR) which is the benchmark magazine of loan syndication managers. The sample is composed of 130 syndicated loans issued or guaranteed by LDC sovereigns between January 1990 and December 1997[4] which also report up-front payments. The sample includes all types of loans except for Islamic financings,[5] issued by sovereigns located in 28 countries. However, of the 130 observations, 29 are reported with missing fees at the top or bottom ends making the calculation of the difference between the top and bottom fees impossible.[6] Moreover, one observation presented some type of security[7] and was deleted. Therefore, the final sample includes 100 observations representing 23 countries. Of these 100 observations, 85 report the number of banks joining the syndicate that is necessary to estimate Models (2) and (1')-(2). The report of the exogenous variables is complete except for three contracts missing the variability of per capita income in the last five years.[8] The descriptive information is presented in Table I and II.

The average bottom and top fees are respectively of 0.39% and 0.55% making the average between top and bottom front-end payments as large as 15.8 basis points. This represents a substantial premium of 40.3% relative to the lowest commitment fee. This will cost the borrower a maximum amount of 181.9 thousands US dollars for the average 115.1 million US dollars loan. Note however that the average up-front fee is substantially lower than in the sample described by Hallak (2001) in which the weighted up-front fee was found as high as 0.743% in average on the

[4] The statutes were verified in the articles of the company, where it should be stated that the national sovereign agent will make sure the company will meet its (foreign) obligations.

[5] Islamic Credit is an equity type of credit that carries no interests. My sample included one Islamic loan only. The facility is the second tranche of a credit signed by Turkish Grained Board (TMO) on 18 September 1997 and guaranteed by the Republic of Turkey. The first tranche is however a regular term loan and therefore has been left in the sample (see International Financing Review No. 1191, 12 July 1997, p. 102-103, for further details).

[6] However, the observation remains suitable for the study if only the lead-manager fee is missing. Each arranger usually obtains top management ranking in the syndicate and hardly discloses his own total compensation.

[7] *Zambian copper conundrum* loan guaranteed by Zambian Ministry of Finance, signed on 17 July 1997. "The principal outstanding is at least 150% covered by copper contracts", in the International Financing Review, No. 1181 May 3 1997, p.58.

[8] Oman 1996, and Slovenia 1993, 1996. The reason Slovenia has missing *variability* observations is due to the long period lag. Slovenia entered international debt markets relatively early after its independence and did not provide GNP figures for the previous five years, yet.

period, January1983 to December 1997. It can be explained by the fact that the sample used by Hallak (2001) covers a period of intensive sovereign restructurings until the Brady plans in the early 1990s. The respective means of the bottom and top participation fees are however similar to the ones described by Esty and Megginson (2003) in their sample of international projects finance (36.9-53.1bp).

The number of lenders per loan is rather heterogeneous too. The mean varies between 6 (Malaysia) and 70 (Thailand). However, preliminary data screening lets no correlation appear between these three parameters of the loan, namely the total number of lenders, the up-front fees difference and the size of the loan.

5 Empirical results

5.1. The number of lenders and relationship lending

Tables IV and V summarize the ordinary and two-stage least-squares estimates of the model's structural parameters. The *Number of joining bks* equations yield several insights. Results show that the number of banks joining the syndicate is mainly determined by loan characteristics. The amount of debt sought in markets has a strong positive impact at 0.01 level. Similarly to Esty and Megginson (2003), the loan lifetime also has a significant negative impact on the number of lenders joining the syndicate at standard levels (0.05). However, the impact of the difference between top and bottom fees is insignificant at standard levels, *t*-statistics being equal to 0.13. Surprisingly, the *Number of arrangers* who seek to bring into existence the syndicate has no impact on the *Number of lenders* who commit at the last stage. Last, the price differential has no impact on the number of banks joining the syndicate at standard significance levels.

Conversely, the OLS estimate of the model described by Equation (1) is reported in the third column of Table IV. *Up-front fees differential* is determined by expected factors with expected signs. The expected renegotiation, which is proxied by the *Liquidity* shortage indicator, has a

significant positive impact on the payment premium at standard levels (5%). This is consistent with the hypothesis that the borrower will attempt to reduce the number of lenders as the prospect of renegotiation augments in order to increase lenders cohesion and reduce renegotiation costs, e.g. Bolton and Scharfstein (1996), Brunner and Krahnen (2001), Morris and Shin (2002). However, the amount of information already available to bankers has a positive impact on the differential. Probably, this is instead related to financial markets general risk exposure.

Columns 4 and 5 present the results of the two-stage least squares estimate of the simultaneous equation model constituted of the system of equations (1')-(2). Interestingly, I find similar results as in the OLS models except that the number of joining lenders has a significant and positive impact on the scale of the price differential among lenders at the 10% level. Therefore, the premium augments with the targeted *number of joining* lenders.

Therefore, results provide little evidence of price discriminating on syndicated loans being aimed at reducing the number of lenders as related e.g. to Morris and Shin (2002) 'common pool' problem as well as the borrower's attempt to reduce the renegotiation costs (Preece and Mullineaux (1996)). Instead, I find strong evidence that suggests that compensations disbursed to large lenders are associated with liquidity shortage risks and asymmetric information. This is consistent with the role of liquidity insurer of the *Hausbank* in German credit markets highlighted by Elsas and Krahnen (1998). The authors did not find any impact on the interest spreads. The findings provide evidence that front-end transfers are associated with a more substantial role during the renegotiation. It is in line with Gorton and Kahn (2000) who expect up-front compensations for future restructurings.

5.2. The lending amounts

The two stage-stage least squares estimates of the simultaneous equation models described by (1')-(2) is presented in columns four and five of Table IV. The *number of joining bks* equation is unchanged with respect to OLS estimate, though. The size of the loan is found to be the strongest

determinant with *t*-statistics equals 7.03. Again, the payment difference has no significant impact (*z*-statistics equals -0.25). As far as the *Up-front fees differential* equation is concerned, I find a significant positive impact of the targeted number of banks joining the syndicate on the price differential at the standard 10% level (*z*-statistics equals 1.80). Apart from the *number of joining bks* determinant, other factors have the same significance as in OLS estimate of Equation (1) presented in the third column of Table IV. Results imply that, all other things being equal, the loans syndicated with a larger price differential are associated with more banks providing additional funds.

As a result, the quantity based price discrimination and the loan size seem more likely to be suitable candidates to motivate for the presence of a difference in payments among lenders. Specifically, the fact that the large lending premium is aimed at increasing the number of lenders gives evidence of the latter being aimed at targeting several lending markets. Additional estimates are presented in Table V. I add the *number of ranks* in Equation (1). The results are reported under model (7) in Table V. Results show that the larger *Up-front fees differential* is associated with a larger *number of ranks* in the syndicate at the 5% level (*t*-statistics equals 2.40). Thus, this provides evidence that the difference in the lending compensations reflects the larger costs incurred by the larger borrower. The story is that the larger sovereign attempts to widen his set of lending relationships for financing capacities purpose. This is consistent with Petersen and Rajan (1994) and Machauer and Weber (2000). I find that costs associated with the size of the loan are transferred up-front, not on used balance. This may explain why the authors did not find any differences in their study based on interest spreads.

5.3. The number of arranging banks

I make the estimate of Model (3) of the number of arranging banks to ensure that large lenders are not selected before syndication. The arrangers would indeed constitute good candidates also to reduce the number of lenders and resolve other mentioned issues. The last column of Table IV

summarizes the results of the Tobit estimates of model (3). Interestingly the number of institutions arranging the syndicate is instead negatively determined by default indicators (solvency) at the 0.05 level. Information asymmetries also significantly increase the number of arrangers at the 0.05 level. Loan volumes have no impact at standard significance levels.

The results are consistent with the hypothesis that the borrower will attempt to reduce information asymmetries by 'hiring' several trustworthy banks to improve the information distribution. However non-reported results show that the number of arrangers has no impact on the number of banks joining the syndicate. Therefore, the additional borrowing costs that the issuer is willing to pay for, are associated with information asymmetries costs for a given targeted number of banks. However, the statistical performance of Model (3) estimate being poor, I believe this result should be regarded as a descriptive result.

6 Sensitivity analysis

I conduct a sensitivity analysis to make sure of the robustness of the results presented in section 5. In this purpose, I test alternative independent variables and regression specifications. With regard to the independent variables, I replaced the *Up-front fees differential* with *Relative spread*, and the *number of joining* lenders with the total *number of lenders*. Moreover, to make my results comparable with Esty and Megginson (2003) study, I also use the *Mean tranche* in the syndicate as a concentration indicator. Unfortunately, the number of observations providing with a complete report of commitments being too low, I was unable to calculate the same concentration ratios.[9] Results are reported in Table V.

I find that the *Relative spread* is sensitive to most of the factors that too determine the *Up-front fees differential* at standard significance levels, namely *liquidity, Loan size, Lifetime. Relative*

[9] The number of observations with a detailed report of final commitments for each bank in the sample is of 19 only, thus being insufficient for a robust statistical analysis of the Herfindhal concentration ratio.

spread is however insignificantly affected by *Public information* and *Variability of income growth.* The *Solvency* indicator is again insignificant.

Interestingly, the *mean tranche* is related to the same factors as the total *number of lenders.* Only the *Number of arrangers* has an additional negative impact as compared with the *Number of joining* banks. This is predictable since arrangers usually commit at top levels (highest shares) thus reducing the available share to potential joining banks.

I associate the positive impact of the size of the country's international debt contracted from private creditors relative to the total LDCs international debts contracted from private creditors. Indeed other indicators of public information are insignificant at standard levels, namely the presence of bond markets for the particular country as well as GNP size. I also changed the *liquidity* indicator for either the ratio of foreign currencies reserves to the total amounts of short-term debt and imports or the ratio of reserves to GNP without affecting the significance of the estimates. The substitution of the *lifetime* of the loan by the calculated *average lifetime* had no impact on the results.

The introduction of the *number of ranks* in Equation (2), has no impact on other determinants of the differential apart from the size of the loan. The number of virtual fee-volume contracts proposed to potential lenders has a positive impact on the overall difference between top and bottom fee, suggesting that the larger discrepancy is associated with a larger set of contracts. The borrower therefore utilizes the price discrimination to tap different markets of syndication. I interpret this result as the evidence that the borrower will enlarge the price differential to obtain additional providers when the loan is larger. The price differential is thus an additional cost that should be associated with the size of the loan, and implicitly with the size of the borrower. This result is consistent with Petersen and Rajan (1994) and Weber and Machauer (2000).

Hence, I can conclude my results are apparently robust. The main findings relate price discrimination on sovereign syndicated credits to the size of the loan and the attempt of the

borrower to increase the number of lenders to obtain a successful syndication. It should be interpreted as an additional cost in the attempt to reach various segments of the lending markets as the size of the loan increases.

7 Concluding remarks

To my knowledge, this paper provides the first comprehensive look at the price differential on syndicated loans. The study is conducted in the sovereign debt environment, where legal enforcement is poor. More specifically, all other terms of the contract being equal (especially seniority), the borrower guarantees higher compensation (in basis points) to institutions providing larger amounts. The lending premium is reflected in the front-end payments (the so-called *up-front fee* is a fee paid at the signature of the contract and before any installment of the loan is yet disbursed). In particular, I address the issue as to whether price differential affects the number of banks participating in the credit facility and relate the positive or negative impact to the gains and costs of the number of lending relationships. Also, I relate the premium to the services provided by larger lenders in periods of liquidities shortage, e.g. liquidity insurer. Alternatively, the borrower attempts to increase the number of market lenders by proposing different sets of contract and larger premiums. The motivation is to raise the requested amounts.

Employing a sample of sovereign syndicated loans between January 1990 and December 1997, I find that the price differential is related to liquidity shortage expectations and information asymmetries. In the multivariate equation as well as the simultaneous equation model, the large lender compensation has no impact on the number of lenders though. Therefore, I find evidence that the large lenders obtain compensation not for reducing the number of lenders but instead for the implicit services provided in situation of financial distress, especially liquidity insurer. This constitutes new evidence that large lenders aim at becoming main banks, and that they obtain compensations for associated services.

Also, the size of the loan significantly and positively affects the number of financial institutions joining the syndicate. It is a positive determinant of the price differential too. The size of the loan thus constitutes a relevant explanation for the price discrepancy. This is consistent with the hypothesis that lenders have limited financing ability and larger borrowers need to expand the number of lenders to raise the requested funds. It is also consistent with the hypothesis that the set of lenders expands as the project increases in poor legal environments such as sovereign debt markets.

Interestingly, the investigation is extended to the number of arrangers. The arranging bank(s) is (are) the bank(s) that collaborates with the issuer to syndicate the facility. I find evidence suggesting that asymmetries of information and the duration of the loan significantly and positively affect the number of arrangers. The proxy for expected short-term distress has an insignificant impact though. Furthermore, the number of arranging institutions has an insignificant impact on the number of banks joining the syndicate. Therefore, I can reject the hypothesis that large lenders would be selected *ex-ante*, and therefore the premium analysis is relevant. However, results have underlying implications. Arrangers are likely to serve as reducers of asymmetries of information in capital markets. This also provides evidence of the existence of valuable private information in sovereign debt markets. Unfortunately, the results are poor and the question definitely deserves further investigation.

Extensions to this paper may hence take several directions. One interesting study is a closer look at the influence of the arranging banks. Exploring the impact on syndicated loan features such as the lending compensations and their discrepancy, the number of lenders, the loan size, is I believe of high relevance. For instance, I suspect that arranging banks with sufficient reputation and knowledge on the borrower are able to reduce borrowing costs. Another possible avenue for future research is the investigation of the consistency of these results with domestic firms and through a cross-country analysis exploring the impact of the legal environment. If it is now becoming clear

that poor creditor rights protection has a positive impact on credit costs and rationing, I suspect that remuneration discrepancies will also be affected by legal factors.

Appendix: The syndication procedure and illustration

The rising of funds through loan syndication is always split into three phases: pre-mandating, post-mandating, and the signature.

In the *pre-mandate phase* the borrower identifies the borrowing needs and makes various contacts with potential arranging banks. The borrower may demand a competitive bid or select a small number of banks through private contacts. This phase is essential for the rest of the syndication and will typically last a few weeks. The potential arranger(s) and the borrower must agree on the terms of the bid before any syndication is launched.

The *post-mandate phase* is the syndication phase. At this stage, both the borrower and the pool of arrangers have their reputation at risk, the latter being contingent on their ability to raise the requested funds. A failure in this phase will probably result in substantial credibility costs. The arrangers then collect the lending offers and rank the syndicators accordingly (e.g. lead-manager, manager, co-manager, participant).

The final phase is the signature ceremony and the execution of the documentation.

Example of syndicated loan

The milestones of the report of the deal displayed here below by the weekly International Financing Review (IFR, thereafter) are the following. Rumors of the pre-mandate phase (search for arranging institutions) were disclosed in July 1996: "A limited number of banks were asked to submit bids on an individual basis and the borrower will be moulding the arranging group, along with consensus pricing" (IFR No. 1143, July 27, 1996). The deal was prepared for public syndication and published four weeks later (IFR No. 1147, August 24, 1996). Last, the signature was successfully announced five weeks later along with further particulars, especially the participating banks (IFR No. 1152, September 28, 1996).

General information

Borrower name	*Republic of Borrowland*
Date of signature	23 September 1996
Type of loan	Term loan
Purpose of the loan	Finance – General Purpose
Business of borrower	Sovereign state
Arrangers	*Bank 1*, *Bank 2*, *Bank 3*, *Bank 4*, *Bank 5*.

Loan information

Amount	150 Million
Currency	US Dollar
Lifetime	7.00 years
Maturity	23 September 2003
Basis rate	London Inter-Bank Offered Rate (LIBOR)
Spread	50bp, rising to 60bp for years six and seven

Cash flow information

Drawdown	Within three months of signing
Tranches	1
Repayment information	Five equal semi-annual instalments starting 60 months after signing

Details of up-front fees

Lead-management fee	30bp for 10 million USD
Management fee	25bp for 7.5 million USD
Participation fee	20bp for 5 million USD

References

Berglöf, E., G. Roland and E.-L. von Thadden, 2000, An Incomplete Contracts Approach to Corporate Bankruptcy, Manuscript, April.

Billett, M. T., M. J. Flannery, and J. A. Garfinkel, 1995, The Effect of Lender Identity on a Borrowing Firm's Equity Return, The Journal of Finance 50(2), 699-718.

Bolton, P. and D.S. Scharfstein, 1996, Optimal Debt Structure and the Number of Creditors, Journal of Political Economy, 104 (1), 1-25.

Boot, A., 2000, Relationship Banking: What Do We Know? Journal of Financial Intermediation 9, 7-25.

Brunner, A. and J.P. Krahnen, 2001, Corporate Debt Restructuring: Evidence on Lender Coordination in Financial Distress, Center for Financial Studies Working Paper, No. 2001/04.

Bulow, J. and K. Rogoff, 1989, Sovereign Debt : Is to Forgive to Forget?, American Economic Review 79, March, 43-50.

Cole, H.L., J. Dow and W.B. English, 1995, Default, Settlement, and Signalling: Lending Resumption in a Reputation Model of Sovereign Debt, International Economic Review 36 (2), May, 365-85.

Datta, S., M. Iskandar-Datta and A. Patel, 1999, Bank Monitoring and the Pricing of Corporate Public Debt, Journal of Financial Economics 51, 435-449.

Dennis, S. and D.J. Mullineaux, 2000, Syndicated Loans, Journal of Financial Intermediation 9 (4), October, 404-26.

Diamond, D. W., 1991, Monitoring and Reputation: the Choice between Bank Loans and Direct Placed Debt, Journal of Political Economy, Vol. 99, August, 689-721.

Eaton, J. and R. Fernandez, 1995, Sovereign Debt, National Bureau for Economic Research Working Paper, No. 5131, May.

Eaton, J. and M. Gersovitz, 1981, Debt with Potential Repudiation: Theoretical and Empirical Analysis, Review of Economic Studies 48, 289-309.

Eichengreen, B. and A. Mody, 2000, Lending Booms, Reserves and the Sustainability of Short-term Debt: Inferences from the Pricing of Syndicated Bank Loans, Journal of Development Economics 63, 5-44.

Eichengreen, B. and R. Portes, eds., 1995, Crisis? What crisis? Orderly Workouts for Sovereign Debtors, Center for Economic Policy Research, London.

Elsas, R., 2002, Learning on the Determinants of Relationship Lending, University of Frankfurt, Manuscript, October.

Elsas, R. and J.P. Krahnen, 1998, Is Relationship Lending Special? Evidence from Credit-File Data in Germany, Journal of Banking and Finance 22, 1283-1316.

Esty, B. C. and W. L. Megginson, 2003, Creditor Rights, Enforcement, and Debt Ownership Structure: Evidence from the Global Syndicated Loan Market, Journal of Financial and Quantitative Analysis 38(1), 37-59.

Gorton, G. and J. Kahn, 2000, The Design of Bank Loans Contracts, Review of Financial Studies 13(2), 331-364.

Grossman, H.I. and T. Han, 1999, Sovereign Debt and Consumption Smoothing, Journal of Monetary Economics 44, 149-158.

Hallak, I., 2001, Bank Loans Non-linear Structure of Pricing: Empirical Evidence from Sovereign Debts, Oxford University Discussion Papers Series 75, June.

Hallak, I., 2003, Courts and Sovereign Eurobonds: Credibility of the Judicial Enforcement of Repayment , Center for Financial Studies, University of Frankfurt, Unpublished.

Heckman, J., 1979, Sample Selection Bias as a Specification Error, Econometrica 47, 153-161.

James, C., 1987, Some Evidence of the Uniqueness of Bank Loans, Journal of Financial Economics, Vol. 19, 217-35.

Lummer, S.L. and J.J. McConnell, 1989, Further Evidence on the Bank Lending Process and the Capital-Market Response to Bank Loan Agreements, Journal of Financial Economics 25, 99-122.

Machauer, A. and M. Weber, 2000, Number of Bank relationship: An Indicator of Competition, Borrower Quality, or Just Size? Center for Financial Studies Working Paper, No. 2000/06.

Megginson, W.L., A.B. Poulsen, and J.F. Sinkey, Jr., 1995, Syndicated loan Announcements and the Market Value of the Banking Firms, Journal of Money, Credit, and Banking 27(2), 457-475.

Mirrlees, J., 1971, An Exploration in the Theory of Optimum income Taxation, Review of Economic Studies 38, 659-670.

Morris, S. and H.S. Shin, 2002, Coordination Risk and the Price of Debt, Cowles Foundation Discussion Paper No. 1241R, February.

Ongena, S. and D.C. Smith, 2000, What determines the Number of Bank Relationships? Cross Country Evidence, Journal of Financial Intermediation 9, 26-56.

Petersen, M.A. and R.G. Rajan, 1994, The Benefit of Lending Relationships: Evidence from Small Business Data, The Journal of Finance 49 (1), 3-37.

Preece, D. and D.J. Mullineaux, 1996, Monitoring, Loan Renegotiability, and Firm Value: the Role of Lending Syndicates, Journal of Banking and Finance 20, 577-593.

Rajan, R.G., 1992, Insiders and Outsiders: The Choice between Informed and Arm's-Length Debt, The Journal of Finance 47 (4), 1367-1400.

Rose, A., 2002, One Reason Countries pay their Debts: Renegotiation and International Trade, Center for Economic Policy Research Discussion Paper No. 3157, January.

Sharpe, S.A., 1990, Asymmetric Information, Bank Lending and Implicit Contracts: A Stylized Model of Customer Relationship, The Journal of Finance 45(4), 1069-1087.

Tirole, J., 1988, The Theory of Industrial Organisation, MIT Press, London.

White, M., 2002, Sovereigns in Distress: Do they need Bankruptcy?, Brookings Papers on Economic Activity 1, 287-319.

Table I

Price Differential and the Number of Lenders by Countries

For each country, the table reports the number of loans contracted or guaranteed by sovereigns with the following information being required: the difference between the lowest and the highest fee paid up-front in percentage points (Fees differential) and the loan amount in constant 1995 million US$ (Amount). The total number of lending institutions (Number of lenders) and the number of banks joining the syndicate (Number of joining banks) are also reported. The difference between the number of lenders and the number of joining banks is the number of arranging institutions that participate in the facility. The sample of individual loans stems from the *International Financing Review* for the period between January 1990 and December 1997. The reported values are mean values calculated over the sample period.

Country	Number of observations reporting:		Fees differential	Amount	Number of lenders	Number of joining banks
	Fees differential	Number of lenders				
Algeria	1	0	0.1000	90.72	.	.
China	5	4	0.2760	198.03	19.25	16.75
Colombia	2	2	0.1875	261.77	23.50	21.50
Czech Rep.	2	2	0.0375	140.39	13.50	12.50
Ghana	2	1	0.1250	58.28	14.00	12.00
Hungary	5	5	0.1520	46.36	11.00	8.00
India	12	11	0.1229	88.94	13.73	10.27
Kazakhstan	1	1	0.1250	47.06	15.00	14.00
Lithuania	2	2	0.1375	82.30	16.50	7.00
Malaysia	2	2	0.0000	120.22	6.00	5.00
Oman	2	2	0.0112	342.22	45.00	36.50
Philippines	3	2	0.1667	73.40	8.50	7.50
Pakistan	3	1	0.0417	97.81	28.00	20.00
Russian Fed.	1	1	0.2000	187.65	29.00	26.00
South Africa	5	5	0.0850	108.91	15.20	10.60
Seychelles	1	1	0.3000	27.89	5.00	4.00
South Korea	4	4	0.2650	101.16	17.25	11.25
Slovakia	1	1	0.0500	111.75	13.00	8.00
Slovenia	2	2	0.1250	80.90	10.00	6.50
Thailand	5	1	0.0790	78.82	70.00	64.00
Turkey	29	26	0.2045	140.29	20.50	18.19
Tunisia	3	3	0.0833	122.71	21.67	18.67
Zimbabwe	7	6	0.1678	48.74	13.50	11.17
Total	100	85	0.1570	115.61	17.96	14.76

Table II

Descriptive Statistics of the Sample

Highest and lowest fees are respectively the highest and the lowest fee in the syndicate in percentage points. Fees differential is the difference between highest and the lowest fees. Number of lenders is the number of financial institutions committing to lending for each loan contract after syndication. Number of joining lenders is the number of non-arranging banks participating in the syndicate. This equals the total number of lenders minus the number of committing arrangers. Note that the joint-arrangers are however counted among the 'joining banks.' Loan size is the credit amount in constant millions of 1995 US dollars. Liquidity is the ratio of foreign currency reserves relative to public and publicly guaranteed short-term debt (less than a year maturity). The ratio proxies for the sovereign's ability to repay in the short-run. Solvency is the ratio of long-term debt (more than a year maturity) relative to GNP. This proxies for the long-run ability to repay. In the sovereign context, this variable provides a proxy for the incentive to repudiate foreign debts. Public information is the ratio of the country's private creditors debt relative to the total less-developed countries private creditors debt.

Variable	Num. of Obs.	Mean	Std. Dev.
Fees differential	100	0.157	0.135
Highest fee	100	0.550	0.543
Lowest fee	100	0.390	0.484
Number of lenders	85	17.96	11.248
Number of joining lenders	85	14.76	10.681
Loan amount (million 1995 USD)	100	115.61	119.06
Liquidity *Reserves to Short-term Debt*	100	2.211	4.154
Solvency *Long-term Debt to GNP*	100	0.260	0.135
Public Information *Country's Bond and Bank Debt to all LDCs Bond and Bank Debt*	100	0.031	0.025
Potential for information asymmetries *Variability of income per capita growth in the last five years*	97	0.137	0.160

Table III

Definition of variables

Variable name	Definition
Endogenous variables	
Fees differential	equals ($Fee_{max} - Fee_{min}$) where Fee_{max} is the top up-front fee and Fee_{min} is the bottom up-front fee.
Relative spread	equals $\frac{AMargin_{max} - AMargin_{min}}{AMargin_{min}}$ $AMargin_{min}$ and $AMargin_{max}$ being respectively top and bottom ends all-in margins. The top (bottom) all-in margin equals the sum of the interest spread (annualised interest margin that takes account for pre-designed variations over the life of the liability) and the top (bottom) end up-front fee calculated as a yearly margin over the lifetime of the loan.
Number of arrangers	Total number of financial institutions, which are mandated for syndicating the loan.
Number of joining bks	Number of non-arranging banks that participate in the loan syndication.
Number of lenders	Total number of financial institutions that participate in the syndicate, including all banks joining the syndicate as well as all arrangers holding a share of the loan after syndication.
Mean tranche	equals $\frac{Loan\ size}{Number\ of\ lenders}$ the average size of the committed tranche for each loan.

Table III

Definition of variables (continued)

Variable name	Definition
Exogenous variables	
Liquidity	Ratio of foreign currencies reserves relative to short-term (lifetime under a year) foreign currency public and publicly guaranteed debts (PPG).
Solvency	Ratio of public and publicly guaranteed (PPG) long-term debts relative to GNP.
Public information	Ratio of the country's total amount of PPG international debts contracted from private creditors (banking and bond debts) relative to all LDCs PPG long-term debts contracted from private creditors debts.
Variability of income growth	Five years variability of GNP per capita growth in the issuing economy. For country i, year $j = 0$, $V(dIncome)_{i,j} = \sum_{j=-4}^{0} \frac{\left(\text{GNP per Capita growth}_{i,j} - \textit{Average}\ \text{GNP per capita growth over the last 5 years}_{0}\right)^2}{5}$
Loan size	Loan amount in constant billion 1995 US dollars, indexed to US consumer prices.
Lifetime	Time duration of the loan in years.
Number of ranks	Number of ranks at the syndication phase which are offered to the markets. Each rank is associated with a given combination amount – fee.
India	Dummy=1 if India is country of risk of the issuer, 0 otherwise.
Turkey	Dummy=1 if Turkey is country of risk of the issuer, 0 otherwise.

Table IV

Models estimates

All variables are defined in Table III. The models described by (1), (2) and (3) are estimated separately. Models (1) and (2) are estimated using OLS while (3) is estimated using the Tobit censured model. The system described by (1')-(2) is estimated separately using two-stage least squares. Country dummies for India and Turkey were included. All variables are defined in Table III. Below the coefficient estimates *t*-statistics are given in brackets for the OLS, *z*-statistics for the 2SL. Number of observations: 100 reporting Fees differential, 85 reporting both Fees differential and the number of banks joining the syndicate, 95 both the fees difference and the number of financial institutions arranging the loan. In addition, the effective number of observations used for the model estimate is reduced because of the absence of three observations on the variability of income growth (see Table II). ***, **, * indicate respectively significance at 1%, 5%, 10% levels.

Eq.	(1)	(2)	(1')	(2)	(3)
Dependent var.	*Fees differential*	*Number of joining bks*	*Fees differential*	*Number of joining bks*	*Number of arrangers*
Fees differential	. .	1.066 [0.13]	. .	-4.947 [-0.25]	. .
Number of joining bks	. .	. .	0.003* [1.80]	. .	. .
Number of arrangers	. .	0.140 [0.43]	. .	0.199 [0.57]	. .
Liquidity	-0.020** [-2.45]	. .	-0.017** [-2.10]	. .	-0.026 [-0.10]
Solvency	0.115 [1.18]	. .	0.970 [1.03]	. .	-5.375* [-1.65]
Public Info	1.635*** [3.13]	. .	1.170** [2.38]	. .	-10.019 [-0.59]
Variability of income growth	0.202** [2.44]	. .	0.223*** [3.00]	. .	5.447** [2.10]
Loan size	0.190* [1.82]	0.562*** [7.61]	. .	0.572*** [7.03]	-0.106 [-0.03]
Lifetime	0.019*** [4.57]	-0.706** [-2.45]	0.023*** [5.85]	-0.619* [-1.70]	0.032** [2.26]
Constant	-0.015 [-0.30]	7.870 [3.89]	-0.047 [-0.87]	10.251*** [4.61]	2.010 [1.26]
R-squared	29.1	44.2	31.3	42.6	3.20
All coeff.=0?	6.14	15.6	41.0	61.3	12.2
N	97	85	82	82	94

Table V

Further results

All variables are defined in Table III. *Mean tranche*, *Number of lenders*, *Relative spread*, and *Fees differential* are treated as endogenous. All other regressors are treated as exogenous. Model (4) substitutes the *Mean tranche* as the endogenous variable in model (1) and adds economic exogenous indicators. Model (5) is the same as model (1), *Number of lenders* substituting the new endogenous variable. (6) is the same as (2), *relative spread* being the new endogenous variable. (7) adds the *Number of ranks* as an exogenous variable of model (2). *t*-statistics are given in brackets below the coefficient estimates. Number of observations: 100 reporting fees differential, 85 reporting both fees differential and the number of banks joining the syndicate, 95 both the fees difference and the number of financial institutions arranging the loan. In addition, the effective number of observations used for the model estimate is reduced because of the absence of three observations on the variability of income growth (see Table II). ***, **, * indicate respectively significance at 1%, 5%, 10% levels.

Eq.	(4)	(5)	(6)	(7)
Dependent var.	*Mean tranche*	*Number of lenders*	*Relative spread*	*Fees differential*
Fees differential	-2.420 [-0.62]	1.895 [0.23]	. .	. .
Number of arrangers	-0.325** [-2.07]	1.131*** [3.48]	. .	. .
Number of ranks	. .	. .	. .	0.034** [2.40]
Liquidity	0.186 [0.68]	. .	-0.009** [-1.86]	-0.018** [-2.17]
Solvency	-2.944 [-0.89]	. .	0.094 [1.63]	0.120 [1.26]
Public Info	-6.648 [-0.38]	. .	0.155 [0.51]	1.364*** [2.61]
Variability of income growth	0.580 [0.22]	. .	0.070 [1.42]	0.196** [2.43]
Loan size	0.260*** [8.25]	0.563*** [7.59]	0.126** [2.07]	0.074 [0.65]
Lifetime	0.200 [1.17]	-0.714** [-2.47]	-0.007*** [-3.08]	0.020*** [4.96]
Constant	4.900*** [3.00]	9.624*** [5.27]	0.075** [2.63]	-0.101 [-1.70]
R-squared	54.6	49.1	29.0	33.4
All coeff.=0?	10.7	19.0	6.1	6.37
N	83	85	97	97

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